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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,815	10/29/2003	Ju-yup Kim	030681-581	4549

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EXAMINER
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RHEE, JANE J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/694,815

**Applicant(s)**

KIM ET AL.

**Examiner**

Jane Rhee

**Art Unit**

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
- Paper No(s)/Mail Date 10/29/03, 8/25/04, 4/20/05

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

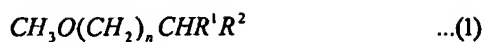
### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,3-7,12-16 of copending Application No. 10449775. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the present pending application and copending application '775 discloses an organic electrolytic solution comprising a lithium salt and an organic solvent containing an alkoxy containing compound of formula (1) below:



where n is an integer from 1 to 5; and R<sup>1</sup> and R<sup>2</sup> are independently selected from the group consisting of halogen atoms, a hydroxy group, a substituted or unsubstituted C<sub>1</sub>-C<sub>20</sub> alkyl group, a substituted or unsubstituted C<sub>1</sub>-C<sub>20</sub> alkoxy group, a substituted or unsubstituted C<sub>2</sub>-C<sub>20</sub> alkenyl group, a substituted or unsubstituted C<sub>6</sub>-<sub>30</sub> aryl group, a substituted or unsubstituted C<sub>6</sub>-C<sub>30</sub> arylalkyl group, a substituted or unsubstituted C<sub>6</sub>-C<sub>30</sub> aryloxy group, a substituted or unsubstituted C<sub>2</sub>-C<sub>30</sub> heteroaryl group, a substituted or unsubstituted C<sub>2</sub>-C<sub>30</sub> heteroarylalkyl group, a substituted or unsubstituted C<sub>2</sub>-C<sub>30</sub> heteroaryloxy group, a substituted or unsubstituted C<sub>5</sub>-C<sub>20</sub> cycloalkyl group, and a substituted or unsubstituted C<sub>2</sub>-C<sub>20</sub> heterocycloalkyl group.

Both present application and copending application discloses that the organic electrolytic solution further comprises at least one of polyglyme and dioxolane. Both present application and copending application discloses wherein the polyglyme is selected from the group consisting of diethyleneglycol dimethylether, diethyleneglycol diethylether, triethyleneglycol dimethylether, and triethyleneglycol triethylether. Both present application and copending application discloses wherein the dioxolane is selected from 1,3-dioxolane, 4,5-diethyl dioxolane, 4,5-dimethyl-dioxolane, 4-methyl-1,3-dioxolane, and 4-ethyl-1,3-dioxolane. Both present application and copending application discloses wherein at least one of the polyglyme and the dioxolane is in a range of 5-95% by volume, and the amount of the compound of the formula or an isomer thereof is in a range of 5-95% by volume, based on the total volume of organic solvent. Both present application and copending application discloses wherein the polyglyme and the oxolane are mixed in a ratio of 1:9-9:1 by volume. Both present application and copending application discloses lithium salt that has a concentration of

0.5-2.0M. Both present application and copending application discloses a lithium sulfur battery comprising a cathode, an anode, a separator interposed between the cathode and the anode and an organic electrolytic solution containing lithium salt, an alkoxy containing compound and at least one of polyglyme and dioxolane. Both present application and copending application discloses wherein the cathode discloses at least one selected from the group consisting of lithium composite oxide, sulfur, catholyte containing  $\text{Li}_2\text{S}_n$  where  $n > 1$ , organo-sulfur, and  $(2\text{S}_x)\text{Y}$ , where  $x$  ranges from 2.5 to 20 and  $y > 2$ . Both present application and copending application discloses wherein the anode is selected from the group consisting of a lithium metal electrode, a lithium metal alloy electrode, a lithium inert sulfur composite electrode, and electrode formed of a carbonaceous material or a graphite material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-21 rejected under 35 U.S.C. 102(b) as anticipated by Mikhaylik et al. (WO 0036683).

As to claims 1-2, Mikhaylik et al. disclose an organic electrolytic solution comprising a lithium salt and an organic solvent wherein the organic solvent comprises 1,3-dimethoxypropane (page 6 and page 14). As to claims 3,5 Mikhaylik et al. discloses that the organic solution contains mixtures of solvents comprising two or more solvents selected from acyclic ethers, glymes and related polyethers and cyclic ethers such as 1,3-dioxolane (page 14 line 29-30). As to claim 4, Mikhaylik et al. discloses that polyglyme is selected from triethyleneglycol dimethylether (page 14 line 14). As to claim 6, Mikhaylik et al. discloses that the volume ratio of the two solvents in the preferred binary mixture may vary from about 5 to 95 to 95 to 5 (page 15 line 3).

As to claim 7, applicant claims the ratio between the polyglyme and the oxolane when mixed are 1:9-9:1 by volume, however in claim 3 applicant claims the organic electrolytic solution need only to contain one of a polyglyme and a dioxolane. Therefore, it is examined to contain one of a polyglyme and dioxolane.

As to claim 8, Mikhaylik et al. discloses that the organic electrolytic solution further contains sulfolane (page 14 line 23 and lines 29-30).

As to claim 9, Mikhaylik et al. discloses that the lithium salt has a concentration of 0.5-2.0M (page 4 line 24).

As to claims 10,13,16,19, Mikhaylik et al. discloses a lithium sulfur battery comprising a cathode that contains sulfur, an anode, a separator interposed between the cathode and the anode (page 22,24).

As to claims 11,14,17,20, Mikhaylik et al. discloses the cathode discloses at least one selected from the group consisting of lithium composite oxide, sulfur, catholyte

containing  $\text{Li}_2\text{Sn}$  where  $n > 1$ , organo-sulfur, and  $(2\text{Sx})_n$ , where  $x$  ranges from 2.5 to 50 and  $n > 2$  (page 22 and 23).


As to claims 12, 15, 1821, Mikhaylik et al. discloses that the anode is formed as a lithium metal alloy electrode (page 24).

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jane Rhee whose telephone number is 571-272-1499. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Jane Rhee  
8/4/04

  
PATRICK JOSEPH RYAN  
SUPERVISORY EXAMINER